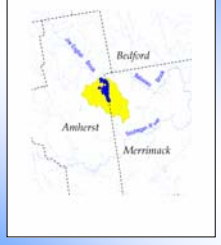
Managing Growth & Sustaining Water Quality

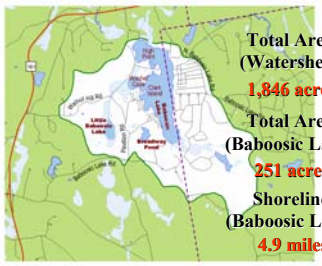
In the
Baboosic Lake
Watershed

UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION

UNIVERSITY OF CONNECTICUT COOPERATIVE EXTENSION SYSTEM

Baboosic Lake Watershed

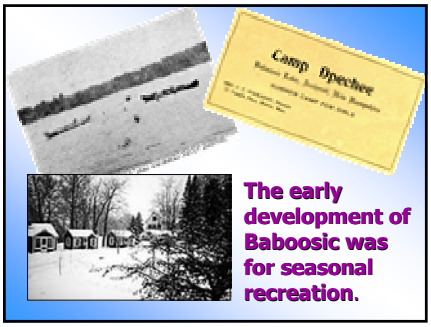




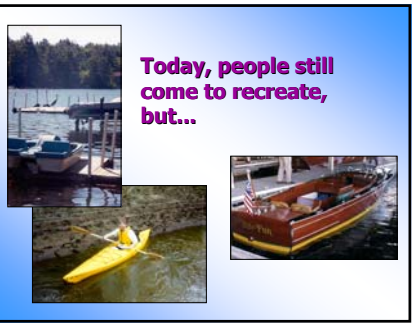
Total Area
(Watershed)
1,846 acres

Total Area
(Baboosic Lake)
251 acres

Shoreline
(Baboosic Lake)
4.9 miles

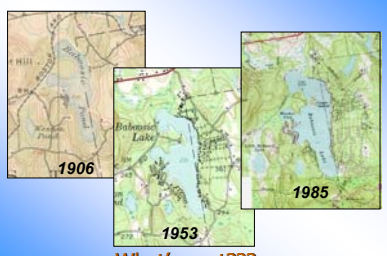


The early development of Baboosic was for seasonal recreation.



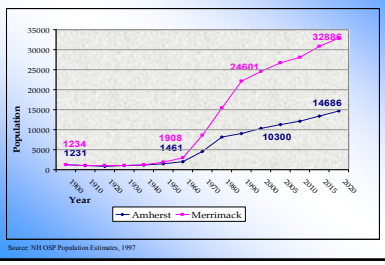
Today, people still come to recreate, but...

This is what has already happened...

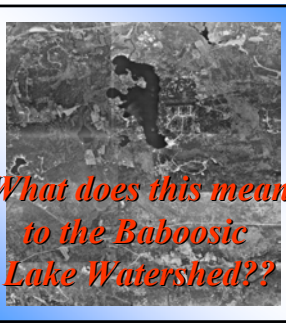


What's next???

Populations are expected to continue growing

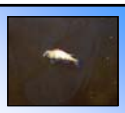


Source: NH OSP Population Estimates, 1997



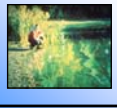
What does this mean to the Baboosic Lake Watershed??

Beach Closings



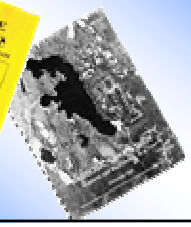
Fish Kills

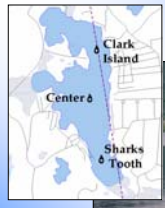
Algal Blooms/ Loss of Water Clarity



Decreased Property Values

Background data on Baboosic has been available since 1983





3 Annual Sampling Sites by UNH

Monitored for:
Dissolved Oxygen
pH
Turbidity
Chlorophyll

What factors may contribute to declining water quality?

Phosphorous (Nutrient Loading)

Phosphorous:

A nutrient used by plant life

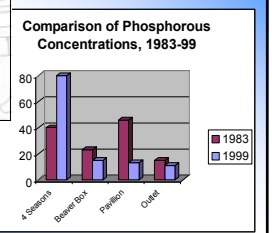
The limiting nutrient for plant growth

Source: NH DES Environmental Fact Sheet #WD-BB 20

Phosphorous originates from:

- *Geologic Materials*
- *Atmospheric Deposition*
- *Waterfowl Waste*
- *Domestic Septic Systems*
- *Urban and Agricultural Runoff*
- *Shoreline Erosion*

Comparison of 1983 & 1999 Studies

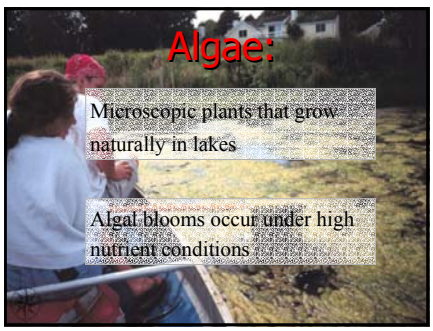


Source:
Baboosic Lake Study, Amherst and Merrimack, NH, January1986
New Hampshire Water Supply & Pollution Control Commission

What factors may contribute to declining water quality?

Phosphorous (Nutrient Loading)

Algae (Chlorophyll)



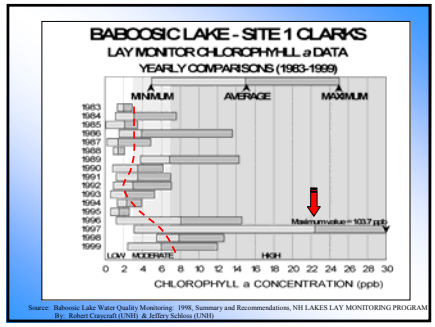
Algae:

Microscopic plants that grow naturally in lakes

Algal blooms occur under high nutrient conditions

Algae is measured by the amount of chlorophyll *a* in the water.

HIGH quantities **DECREASE** water clarity.



Source: Babcosic Lake Water Quality Monitoring: 1998, Summary and Recommendations, NH LAKES LAY MONITORING PROGRAM By: Robert Craycraft (UNH) & Jeffery Schloss (UNH)

What factors may contribute to declining water quality?

Phosphorous (Nutrient Loading)

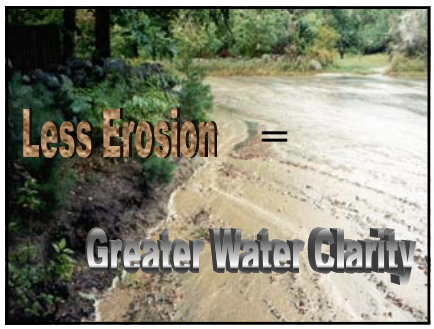
Algae (Chlorophyll)

Turbidity (Sediment Loading)

Turbidity:

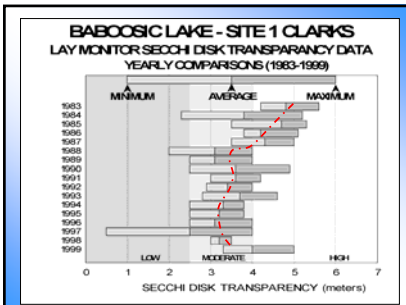
Sediment that is stirred up and suspended in water

High levels reduce the available sunlight necessary for life



Secchi Disk:

A Secchi disk is used to measure water clarity



Source: Babcosic Lake Water Quality Monitoring: 1998, Summary and Recommendations, NH LAKES LAY MONITORING PROGRAM

What do the numbers show??

Phosphorous
Higher than recommended values

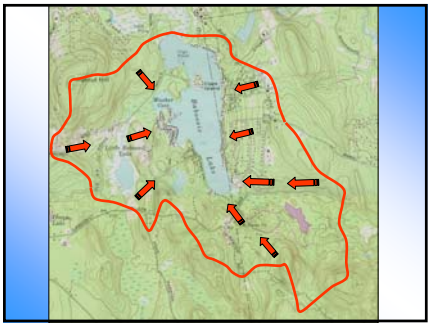
Algae
Increasing Chlorophyll *a* counts

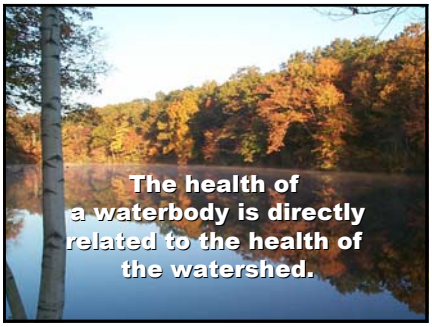
Turbidity
Trend of declining clarity

If we are seeing problems today,

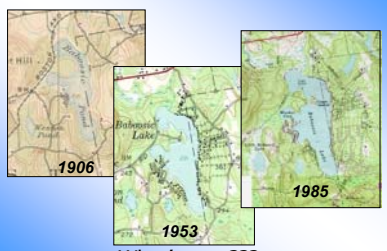
we can accept it
OR
plan development activities accordingly...

This requires a watershed effort!

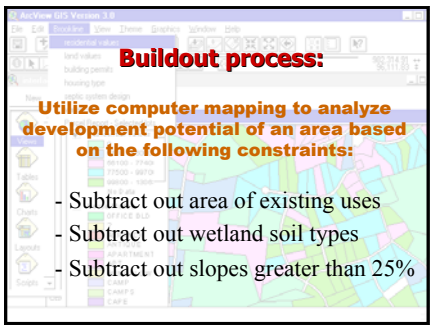


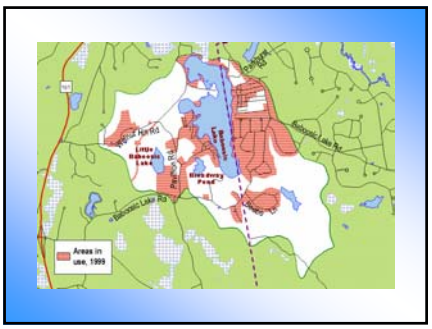


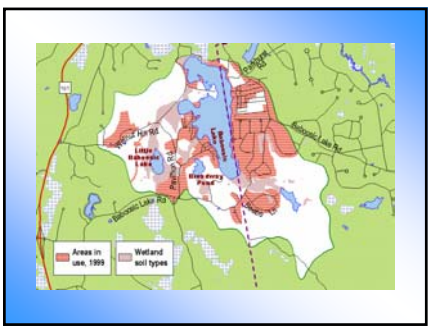
This is what has already happened....

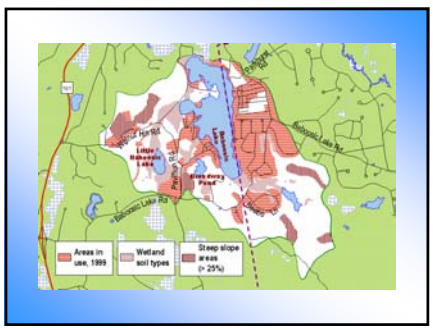


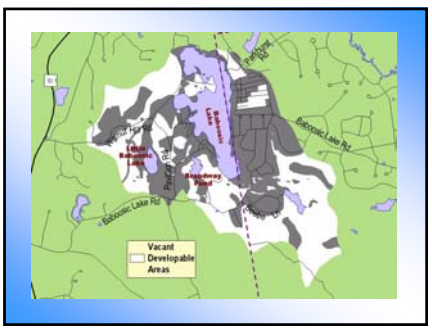
What's next???











Remaining buildable area: **853 acres**
Amherst: **453 acres (54% of total)**
Merrimack: **400 acres (48% of total)**
Based on current zoning (2000)*:

203 potential house lots in Amherst
200 potential house lots in Merrimack

*Amherst zoning requires a minimum 2 acre lot size in the vicinity of Baboosic Lake

*Merrimack zoning for this area has flexible lot sizes based on soil limitations; this analysis assumes the mid range lot size of 1.8 acres applies.

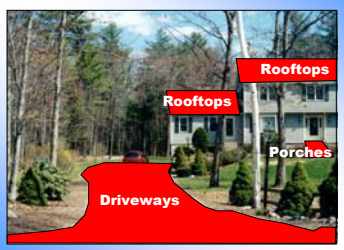
How do we deal with all this

GROWTH ?

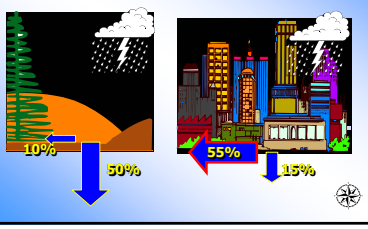
Three areas that can be addressed include:

1st: Comprehensive Planning to Reduce Impervious Surfaces

Impervious surfaces



Development Impacts on the Water Cycle



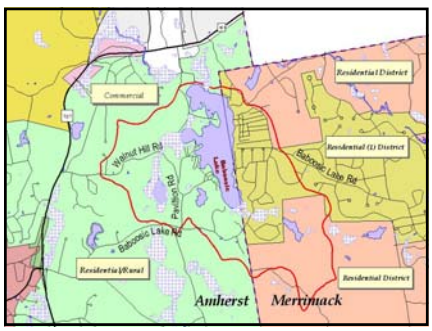
Questions for your zoning:

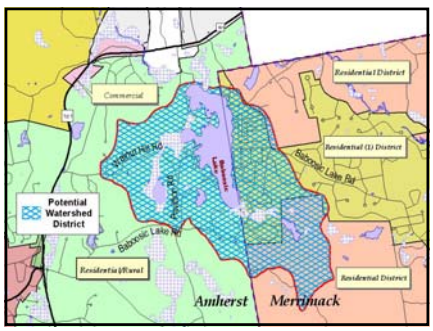
Are ordinances consistent with watershed goals?

Are they consistent with the neighboring town?

Do they address impervious surfaces?

How are they enforced?





Three areas that can be addressed include:

1st: Comprehensive Planning to Reduce Impervious Surfaces

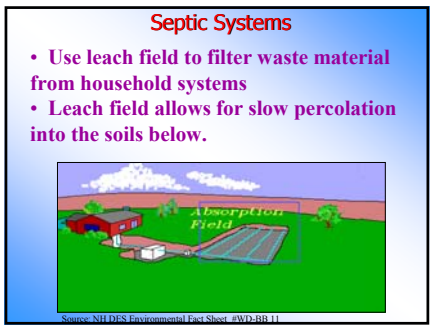
2nd: Site Design

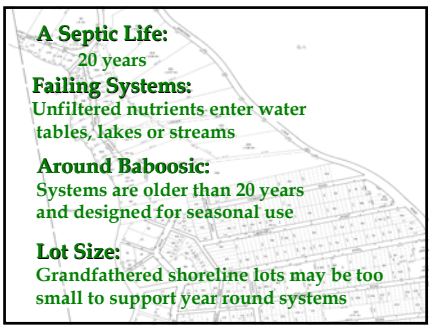

Site Design & Erosion Control:
• Minimize impervious surfaces
• Utilize effective stormwater systems


Are your current drainage systems working properly??
Storm drains need to be cleaned regularly


Open drainage systems offer a means of collecting and absorbing runoff


A potential source of phosphorous comes from failing septic systems


Septic Systems
• Use leach field to filter waste material from household systems
• Leach field allows for slow percolation into the soils below.
Absorption Field
Source: NH DES Environmental Fact Sheet #WD-BB 11


A Septic Life:
20 years
Failing Systems:
Unfiltered nutrients enter water tables, lakes or streams
Around Baboosic:
Systems are older than 20 years and designed for seasonal use
Lot Size:
Grandfathered shoreline lots may be too small to support year round systems


For failing systems or those under capacity, try the following alternatives:
Composting Toilets
Chemical Toilets


Report failing stormwater & septic systems to local town officials
•Department of Public Works
•Health Officials
•Conservation Commission
We're accessible …really!
Nashua Telegraph, Sunday June 4, 2000.


Three areas that can be addressed include:
1st: Comprehensive Planning to Reduce Impervious Surfaces
2nd: Site design
3rd: Best Management Practices

Tips for handling up-to-date systems

*Inspect septic system and pump on a regular schedule

*Compost kitchen garbage rather than using a disposal.

*Conserve water whenever possible

*Never flush toxic materials (such as paint, oil or pesticides) down drain.

Lake Friendly- Landscaping

- Minimize Clearing Vegetation
- Leave Buffer Strips Above and Below Clearings
- Use Native or Low Maintenance Shrubs
  -- (Less Need for Water and Fertilizer)
- Keep Grass High or Alternative Ground Covers
- Get Soil Tested Before You Apply Any Fertilizers or Amendments
- Use Low or No Phosphorous Slow Release Nitrogen Blends